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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/173,646

Applicant(s)

FUKUDA, TOSHIYA

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12-14 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-14 and 16 is/are allowed.
- 6) ☒ Claim(s) 1-9 and 17-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-3, 7-8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (U.S. Patent 6,546,014).

Regarding claims 1-2 and 19, Kramer et al. discloses in FIG. 2 an optical communication system having an optical line terminal (OLT, equivalent to station apparatus of instant claim) and a plurality of optical network units (ONUs, equivalent to subscriber resident apparatuses of instant claim). Kramer et al. teaches in FIG. 3 through FIG. 8 and col. 6, line 54- col. 9, line 14 the operation of the polling scheme for the optical communication system. In particular, Kramer et al. teaches in FIG. 3 that OLT selects ONU-1 and sends a grant message (equivalent to permission issuance information of instant claim) for ONU-1 to all ONUs. Upon receiving the grant message, ONU-1 sends predetermined data to OLT while other ONUs (i.e., ONU-2 and ONU-3) do not send any data to the OLT. Kramer et al. teaches in FIG. 12 and col. 13, lines 9-36 that the ONUs transmit REQUEST messages and the authorized amount of data in response to the GRANT message which is equivalent to the transmission issuance information of instant claim. Note that REQUEST message is not the same as transmission request signal of instant specification. Kramer defines in col. 7, lines 16-18 that a REQUEST message is a control message, which is equivalent to control information of instant claim. The difference between Kramer et al. and the claimed invention is that Kramer et al. sends control information before the data. However, one of ordinary skill in the art could have changed the order of the control

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information and the data because the swapping of the data and the control information would have yield predictable results to one of ordinary skill in the art at the time of the invention. Therefore, the claimed invention is obvious over Kramer et al. Furthermore, the Examiner recognizes that the existence of claimed difference is not an attempt by applicant to solve a problem but merely amounts to selection of expedients known to the artisan of ordinary skill as design choices.

Regarding claim 3, each ONU is provided with an ID, for example, ONU 206 is provided with ID 1 and ONU 208 is provided with ID 2. Kramer et al. teaches in FIG. 3 that the grant message includes a node identification (NID) field identifying the destination ONU. Kramer et al. teaches in col. 1, lines 51-54 that each ONU only processes data intended for that ONU and discards information blocks that are intended for the other ONUs.

Regarding claim 7, Kramer et al. teaches in FIG. 5 that each ONU is associated with a round-trip time (RTT) and teaches in FIG. 11 that when a upward main data is not received within a predetermined time period, the next ONU is polled.

Regarding claim 8, Kremer et al. teaches in FIG. 1A that OLT sends downward main data to ONUs. The downward main data includes ONU ID and each ONU receives downward main data that is destined to it and discards downward main data that is destined to other ONUs.

3. Claims 1-3, 6-7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer (G. Kramer, "Multiple Access Technologies for ePON", IEEE 802.3 EFM Study Group Meeting, March 2001) in view of Schwartz ("Telecommunication Networks" by M. Schwartz, Addison-Wesley, 1987, pp. 408-419).

Regarding claims 1-2 and 19, Kramer teaches on page 4, FIG. (a) an optical communication system comprising an OLT (equivalent to station apparatus of instant claim) and multiple ONUs (equivalent to subscriber resident apparatuses of instant claim) connected to the OLT. Kramer illustrates on pages 5 and 9 that the OLT and ONUs send/receiver data: Kramer teaches on page 8 various schemes for controlling the traffic over the optical communication system. In particular, Kramer teaches roll-call polling which is appropriate for broadcasting star configuration as shown on page 4, FIG. (a). The difference between Kramer and the claimed invention is that Kramer does not teach the details of the roll-call polling scheme. However, roll-call polling is well known in the art. For example, Schwartz explains in Section 8-1-1 (pp. 408-419) roll-call polling. Schwartz teaches on page 408 that stations (e.g., ONUs) are interrogated sequentially, one by one, by the central system (e.g., OLT) which asks if they have any messages to transmit. The interrogation for a particular station is permission for that station to transmit. Schwartz teaches on page 408 that the transmission is concluded with an indication to the central controller that its transmission is completed (equivalent to control information of instant claim). One of ordinary skill in the art would have been motivated to combine the teaching of Schwartz with the optical communication network of Kramer because Schwartz provides the details for implementing the scheme. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the roll-call polling scheme, as taught by Schwartz, in the optical communication network of Kramer because Schwartz provides the details for implementing the scheme.

Regarding claim 3, Schwartz teaches in FIG. 8-4 HDLC frame format which include A-field for secondary station address.

Regarding claim 6, Schwartz teaches on page 410, third paragraph that that last frame has its F bit set to 1, indicating the completion of the transmission in response to the poll.

Regarding claim 7, it is well known that in a roll call, if no response after a certain time, the next in the roll is called.

4. Claims 4-5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (U.S. Patent 6,546,014) in view of Kolis et al. (U.S. Patent 6,550,680 B1) or Haartsen (U.S. Patent Application Pub. 2002/0003812 A1).

Kramer et al. has been discussed above in regard to claims 1-3, 7-8 and 19. Regarding claim 4, Kramer et al. further teaches in FIG. 4 that ONU-1 sends upward main data including a NID field 406. (Note that the text has a typo in col. 7, line 21. "NID field 404 and a WS field 406" should read "NID field 406 and a WS field 404.") The difference between Kramer et al. and the claimed invention is that Kramer et al. does not teach to discard the upward main data when the ID included in the upward main data and the ID of the selected ONU do not match. Kolis et al. teaches in col. 14, lines 3-6 that in a polling access control mechanism, address of the reply should be verified to see whether it matches the address polled. If the addresses do not match it is an error and the data should be discarded. Haartsen teaches in paragraph [0019] that only if sufficient bits in the received preamble match with the expected code, the packet is accepted; otherwise the packet is discarded. One of ordinary skill in the art would have been motivated to combine the teaching of Kolis et al. or Haartsen with the modified optical communication system of Kramer et al. because verifying match between received data and expected data detects error and ensures data integrity. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to verify match between received ID and expected ID, as taught

by Kolis et al. or Haartsen, in the modified optical communication system of Kramer et al. because the approach detects error and ensures data integrity.

Regarding claim 5, Kremer et al. teaches in FIG. 1A and 1B end user (equivalent to subscriber network of instant claim) connected to each ONU.

Regarding claim 9, Kremer et al. teaches in FIG. 1A that OLT sends downward main data to ONUs. The downward main data includes ONU ID and each ONU receives downward main data that is destined to it and discards downward main data that is destined to other ONUs.

5. Claims 4-5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer and Schwartz as applied to claims 1-3, 6-7 and 19-20 above, and further in view of Kolis et al. (U.S. Patent 6,550,680 B1) or Haartsen (U.S. Patent Application Pub. 2002/0003812 A1).

Kramer and Schwartz have been discussed above in regard to claims 1-3, 6-7 and 19. The difference between Kramer and Schwartz and the claimed invention is that Kramer and Schwartz do not teach to discard the upward main data when the ID included in the upward main data and the ID of the selected ONU do not match. Kolis et al. teaches in col. 14, lines 3-6 that in a polling access control mechanism, address of the reply should be verified to see whether it matches the address polled. If the addresses do not match it is an error and the data should be discarded. Haartsen teaches in paragraph [0019] that only if sufficient bits in the received preamble match with the expected code, the packet is accepted; otherwise the packet is discarded. One of ordinary skill in the art would have been motivated to combine the teaching of Kolis et al. or Haartsen with the modified optical communication system of Kramer and Schwartz because verifying match between received data and expected data detects error and ensures data integrity. Thus it would have been obvious to one of ordinary skill in the art at the

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time the invention was made to verify match between received ID and expected ID, as taught by Kolis et al. or Haartsen, in the modified optical communication system of Kramer and Schwartz because the approach detects error and ensures data integrity.

Regarding claim 5, Kremer teaches in page 5 users connected to ONUs.

Regarding claim 9, Kremer teaches in page 5 that ONU ignores downward data that is destined to other ONUs.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (U.S. Patent 6,546,014) in view of Tanenbaum ("Computer Networks" by A. Tanenbaum, Prentice-Hall, 1981, pp. 119-121).

Kramer et al. has been discussed above in regard to claims 1-3, 7-8 and 19. The difference between Kremer et al. and the claimed invention is that Kremer et al. does not teach sending transmission completion information. Tanenbaum teaches in Section 3.4.1 polling technique. In particular, Tanenbaum teaches in p. 120 fourth and fifth paragraphs and FIG. 3-15 BISYNC protocol which includes ETX to indicate end of transmission. One of ordinary skill in the art would have been motivated to combine the teaching of Tanenbaum with the modified optical communication system of Kramer et al. because an explicit indication of end-of-transmission allows the OLT to start polling other ONU immediately instead of waiting for timeout in case when ONU has less amount of data to send than the amount that is allowed by the OLT. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to send transmission complete at the end of transmission, as taught by Tanenbaum, in the modified optical communication system of Kramer et al. because an explicit

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indication of end-of-transmission allows the OLT to start polling other ONU immediately instead of waiting for timeout.

7. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (U.S. Patent 6,546,014) in view of Jackson et al. (U.S. Patent 6,798,789 B1).

Kramer et al. has been discussed above in regard to claims 1-3, 7-8 and 19. The difference between Kremer et al. and the claimed invention is that Kremer et al. does not teach sending suspension instructing signal. Jackson et al. discloses in FIG. 2 a serial I/O interface 106 similar to the interface between buffer 212 and data or between Proc 222 and data of FIG. 2 of Kremer et al. Jackson et al. teaches in col. 4, line 59-col. 5, line 6 that a suspend instruction is useful for stopping the data source from sending data faster than the Proc 216 or 222 can process. One of ordinary skill in the art would have been motivated to combine the teaching of Jackson et al. with the modified optical communication system of Kremer et al. because the suspension protocol avoids losing data when the data source sending data faster than the processor can process. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to send suspension instructing signal when the processor cannot process data as fast as data is received and the buffer is about to be full, as taught by Jackson et al., in the modified optical communication system of Kremer et al. because the suspension protocol avoids losing data.

Allowable Subject Matter

8. Claims 12-14 and 16 are allowed.

Response to Arguments

9. Applicant's arguments filed 19 July 2007 have been fully considered but they are not persuasive.

The Applicant argues that Kramer sends REQUEST message before upward main data. However, the REQUEST message and main data are different fields of the same data stream. One of ordinary skill in the art could have changed the order of the control information and the data because the swapping of the data and the control information would have yield predictable results to one of ordinary skill in the art at the time of the invention. Therefore, the claimed invention is obvious over Kramer et al. Furthermore, the Examiner recognizes that the existence of claimed difference is not an attempt by applicant to solve a problem but merely amounts to selection of expedients known to the artisan of ordinary skill as design choices.

The Applicant argues on page 21 that in Schwartz, after the central system receives responses in the form of control information from each of the stations, it generates a polling list to assign resources. Nowhere does such teaching have been found in Schwartz. Schwartz teaches on page 408 the simplest polling strategy, that of polling each of the N stations sequentially.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (7:30 a.m. - 4:30 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

skl

8 September 2007



SHI K. LI
PRIMARY PATENT EXAMINER